

REMARKS

Applicants respectfully request reconsideration and allowance of all pending claims.

I. Status of the Claims

Upon entry of this amendment, claims 1-7, 17, and 65-74 remain pending. New claims 75-77 are added.

New claims 75 and 76 are supported by paragraph 0040 of the specification.

New claim 77 is supported by paragraph 0035 of the specification. As one skilled in the art will understand from the specification as a whole, and paragraph 0035 in particular, copper sulfate is present in substantially dissociated form in a sulfuric acid electroplating bath. Thus, where the source of copper sulfate is copper sulfate pentahydrate, as described in paragraph 35, the salt dissociates to cupric ions, hydrogen sulfate ions, sulfate ions and water molecules in the bath. Copper ions may be solvated in the bath, but the pentahydrate structure of the source salt is substantially dissipated. Those skilled in the art will further understand that unhydrated or only partially hydrated copper sulfate could be used alternatively to the pentahydrate in preparing the electroplating solutions. Thus, it is appropriate to quantify the copper sulfate concentration as "equivalent copper sulfate pentahydrate" without positively requiring that the pentahydrate be the actual source.

Applicants note that the previous rejections of claims 1-7, 17 and 65-73 under 35 U.S.C. §112 have been withdrawn in view of Applicants' prior amendment (Amendment H) of December 18, 2006.

II. Claim Rejections - 35 U.S.C. §103(a)

Reconsideration is respectfully requested of the rejection of claims 1-7 and 65-71 as unpatentable over Creutz (US 4,110,176) in combination with Barstad (US 6,444,110). It is respectfully submitted that: (a) the claimed process is not rendered *prima facie* obvious by the Barstad and Creutz references; (b) even if *prima facie* obviousness were established, it is overcome by the beneficial effect of enhanced incorporation of chloride ions which inhibit creep deformation; (c) the authority of *In re Dillon* is inapplicable to the instant claims which include positively recited features not rendered obvious from the references; and (d) even if the rule in *Dillon* were extended, and if it had been obvious to combine the references for reasons other than the enhanced incorporation of chlorides, the combination would not have inherently yielded the invention as claimed.

No Prima Facie Obviousness

Obviousness must be evaluated against the teachings of the prior art as a whole, *In re Naylor*, 152 USPQ 106, 108 (CCPA 1966). Obviousness cannot fairly be established by hindsight selection and combination of elements from the mass of irrelevant and/or misdirectional disclosure contained in the references. Under the statute, obviousness must be established against the entire background of the art at the time the invention was made, not by winnowing the relevant from the irrelevant to reconstruct the claimed combination after the fact.

Given the major differences between integrated circuits and printed circuit boards, it is respectfully submitted that a skilled artisan concerned with integrated circuits would not have started with a reference such as Creutz, which is directed to plating printed circuit boards and rotogravure cylinders. It

is respectfully submitted, therefore, that the current rejection over a combination with Creutz as the primary reference is inappropriate. The Examiner's quotation from Barstad reinforces this conclusion. Not only is Barstad addressed to producing integrated circuit chips, but this reference also purports to have solved the problem of defects in micro scale vias and trenches. Since Barstad et al. fill vias and trenches in integrated circuits as well as circuit boards, one skilled in the art would have seen no technical reason to resort to Creutz which deals essentially only with leveling in printed circuit boards.

Notably, Barstad et al assert that the problem of defects in fine vias and trenches is resolved by increasing the brightener content. As described by Barstad and generally known in the art, brighteners are typically organic compounds that have sulfide and/or sulfonic acid groups, e.g., compounds that correspond to the formula $\text{HS-R-SO}_3\text{X}$ where R may be an optionally substituted alkyl, heteroalkyl, or hetero alicyclic group and X is a counterion such as sodium or potassium. Thus, Barstad et al. purport to obviate the need for resort to other references to resolve the problem confronted by the instant invention. In the circumstances, a reading of Creutz reveals it to be inapposite, while a reading of Barstad, which came long after Creutz, suggests that Creutz is not merely irrelevant but obsolete.

Creutz may relate to throughhole plating, as the Office action states, but Creutz is an old reference focused on printed circuit boards while Barstad is a more current teaching that is further directed to integrated circuits. Thus, in plating of integrated circuits, one skilled in the art would have found it obvious to follow Barstad instead of Creutz, not in combination with Creutz.

Moreover, any artisan who gave notice to Creutz would have learned that the reason Creutz selected an *alkoxylated* polyethylenimine structure for his leveling agent was to increase solubility thereof as compared to the non-alkoxylated species:

In U.S. Pat. No. 3,770,598, assigned to the assignee of the present invention, there has been proposed the addition of certain reaction products to acidic copper plating baths to yield generally the above recited benefits. These prior art additives are formed by the reaction of polyethylenimine with an alkylating agent, such as benzyl chloride. While these reaction products are efficacious in improving the copper deposit, often they may be found to be relatively insoluble in the aqueous acidic plating baths.

SUMMARY OF THE INVENTION

It has been found that improved copper deposits can be obtained from aqueous acidic copper plating baths by the addition thereto of poly (alkanol quaternary ammonium salts). Such salts are more soluble in and more compatible with the aqueous acidic baths as compared with the previously utilized alkylated polyethylenimines of the prior art.

(Creutz 4,110,176; col. 1, lns 16-35).

Note in this connection that Creutz contemplates concentrations of the leveling agent of up to 1000 mg/L (abstract; claim 1).

A reading of Barstad, on the other hand, effectively minimizes or eliminates solubility of a leveling agent as a significant consideration. Apparently because they concluded that the defect problem was resolved by increasing the concentration of the sulfur-bearing brightener compound, Barstad found levelers of any kind, including polyethyleneimine based levelers, to be merely optional. The Barstad et al. working

examples include no leveler at all. Although the Barstad et al. specification elsewhere states that "use of one or more leveling agents in plating baths is generally preferred," their list of typical leveling agents (col. 6, line 64 to col. 7, line 17) cross-references the early Creutz patent 3,770,598, which discloses the reaction product of benzyl chloride and a *non*-alkoxylated polyethylenimine, while pointedly ignoring the Creutz reference applied by the Examiner here, which had been long available to the art.

Moreover, selection of the *non*-alkoxylated species quite apparently met Barstad's needs since the latter specification teaches that "[t]ypical concentration of leveling agents range from 0.05 to 0.5 mg/L" (col. 7, ll. 17-19), concentrations at the remote lower end of the 0.04 to 1000 mg/L range taught by Creutz. At the minimal optional concentrations they contemplated, Barstad apparently saw no need to go to the effort and expense of alkoxylating the polyethylenimine prior to reaction with benzyl chloride or other quaternizing agent. One skilled in the art who read the Barstad disclosure would have been drawn to a similar conclusion.

Although the working examples of Creutz call for relatively modest concentrations of the leveling agent, ranging from 0.4 mg/L to 1 mg/L, these numbers are still well above all but the uppermost end of the 0.05 to 0.5 mg/L range taught by Barstad, and are especially substantial compared to the working examples of Barstad which use no leveling agent at all. Thus, considering the disclosures as a whole, one skilled in the art would not have been led to select the leveling agent of Creutz for incorporation into the plating baths disclosed by Barstad. Certainly, one skilled in the art would not start with Creutz to address the problem in integrated circuits that is dealt with by the instant invention. However, accepting *arguendo* the premise

that one skilled in the art would be led to modify Creutz in light of Barstad, the teachings of Barstad would effectively override the earlier disclosure of Creutz. These teachings of Barstad would lead one skilled in the art to select a high concentration of a brightener consisting of a sulfide compound in lieu of the quaternized alkoxyated polyethylenimine earlier used by Creutz. One skilled in the art would have seen no purpose in going to the trouble of alkoxylation when Barstad effectively teaches that it is unnecessary, in fact that any leveling agent is unnecessary.

With regard to the authority of *Meinhardt*, it is recognized that non-preferred teachings cannot be disregarded, but the omission of any leveling agent from the Barstad working examples nonetheless detracts from obviousness, and the pointed *omission* of alkoxyated amines from the list of leveling agents further detracts, especially considering the ultra low concentrations of leveling agent that Barstad optionally contemplates. As to Creutz, this reference contains no teaching directed to integrated circuits, either preferred or non-preferred. Applicants agree that the test for obviousness is what the teachings of the references would have suggested to those of ordinary skill, or what one of ordinary skill would otherwise have found obvious from combining the teachings of the references; *KSR International v. Teleflex*, ___ U.S. ___ (2007). But where the references are either skewed or opposed in their respective teachings, there would have been no obvious way to combine them. And that is the case here. Thus, one skilled in the art would understand from Barstad that alkoxyated levelers are unnecessary, that levelers in general are unnecessary, that levelers if used should be present in tiny concentrations, and that Creutz is obsolete. This person would not have reasoned that Creutz's old PCB plating baths should be extended to

integrated circuits. While it may now be known that the Creutz plating baths could be used at high leveler concentration to deposit copper on an integrated circuit, that knowledge flows from applicants' invention, not from the references. For the reasons discussed above, the plating baths of Barstad differ materially from Creutz, and one skilled in the art would have been led to choose the baths of Barstad, not those of Creutz. Accordingly, it is respectfully submitted that it would not have been *prima facie* obvious to combine Barstad and Creutz for any purpose. And, at all events, it would not have been *prima facie* obvious to use "a reaction product of benzyl chloride and hydroxyethyl polyethylenimine" to reduce defects in a process for "electroplating a copper deposit onto a semiconductor integrated circuit device with electrical interconnect features including submicron-sized features such that the surface has submicron sized reliefs therein," as called for in claim 1.

III. Incorporation of Chlorides and Inhibition of Creep Deformation Further Negates *Prima Facie* Obviousness

Nothing in the references remotely suggests that the overall chloride and sulfur content of the copper deposit would be increased by electroplating an integrated circuit device substrate in the presence of the reaction product of benzyl chloride and hydroxyethyl polyethylenimine. Much less is there any suggestion that enhanced sulfide and/or chloride content would have value in resisting creep deformation of the deposit. The Examiner acknowledges as much by apparently admitting that "creep deformation is not a serious problem in copper through holes in PCB substrates."

It is applicants' understanding that the Examiner does not contend that the references contain any teaching on either

enhanced chloride levels, enhanced sulfide levels, or inhibition of creep deformation.

It is Applicants' further understanding that the continued §103(a) rejections are based entirely on the construction of *In re Dillon* as holding that:

(i) if it would have been obvious for any purpose to combine references, however unrelated that purpose may be to the structures and effects claimed by Applicants; and

(ii) if the resulting combination would inherently meet the terms of the claims, even if the inherency is only latent and remains unknown to the art until Applicants have made their invention;

then the claimed invention can be held obvious under 35 U.S.C. §103.

It is respectfully submitted that the rule invoked in *Dillon* applies only to composition claims of the type under examination there, where all structural features of the claim would have been obvious from the prior art. Alleged inherency has no relevance to obviousness of the instant method claims that positively recite process features that are not obvious from the references that are cited.

It may be noted that the *Dillon* opinion expressly relies on *In re Shetty*, 195 USPQ 753, in which a composition claim was held *prima facie* obvious because it would have been obvious to one skilled in the art to prepare the composition, albeit for a purpose different from that described in the Shetty specification. However, the very same *Shetty* opinion reversed the rejection of a method of treatment claim that recited the use of the novel compound for the applicant's purpose. Supporting reversal, the court stated:

[Inherency] is quite immaterial if, as the record establishes here, one of ordinary skill in the art

would not appreciate or recognize that inherent result
....

The method claims at issue in *Shetty* were directed to methods for appetite control and the cited prior art disclosed compounds and dosages useful for combating microbial infestation. The *Shetty* court stated that the Office had "failed to show a reasonable expectation, or some predictability" that the prior art compound disclosed in the first reference would be an effective appetite suppressant if administered in the dosage disclosed in the second reference and that the Office's hindsight assertion that the dosages would make the weight loss method obvious was insufficient.

See also *In re Spormann*, 150 USPQ 449 (CCPA 1966) and *In re Naylor*, *supra*.

In *Spormann*, the claims were to a process for producing sodium sulfite by passing a finely dispersed aqueous solution of NaOH, Na₂CO₃, NaHCO₃, KOH, K₂CO₃, or KHCO₃ into a substantially dry gas containing SO₂. By conducting the process in dry conditions, oxidation of the sulfite to sulfate was avoided even in the presence of oxygen and heavy metals, thereby allowing the use of roaster gases as the source of SO₂. The Patent Office argued that the claimed process was obvious from a reference which taught reaction of SO₂ with powdered NaOH or Na₂CO₃ in view of references teaching conventional processes for contacting SO₂ streams with aqueous alkaline solutions. The Office specifically contended that suppression of oxidation of sulfite to sulfate was inherent in the powdered NaOH reference and would also be inherent in the assertedly obvious combination.

In reversing the rejection, the court analyzed the Patent Office position and held as follows:

The board apparently thought the minimizing of sulfate would be inherent in the process of Friedrich et al.

However this is no support for a rejection for various reasons. Friedrich et al. make no mention of it, as the board conceded. Their process is not appellants' process. It is a reaction between solid, powdered material and gas, the only water present being chemically combined water and hygroscopic water As we pointed out in *In re Adams*, 356 F.2d 998, 148 USPQ 742, the inherency of an advantage and its obviousness are different questions. That which may be inherent may not necessarily be known. Obviousness cannot be predicated on what is unknown." (150 USPQ at p. 452; emphasis in the original)

In *Naylor* the claim was to the polymerization of butadiene in the presence of a catalyst system comprising a Ziegler catalyst plus a promoter comprising an ether, amine or amide. Incorporation of the promoter yielded a product predominantly comprising the 1,2 addition polymer. The Patent Office rejected the claim over a reference which showed polymerization of butadiene in the presence of a conventional Ziegler catalyst in view of another reference teaching the polymerization of mono-olefins such as ethylene or propylene in the presence of a catalyst system comprising a Ziegler catalyst plus an ether or amine. The latter reference taught that the ether or amine component was found to increase the speed of polymerization of the mono-olefin as well as the polymer yield.

The Examiner said it would have been obvious to combine the teachings of the reference by adding an ether or amine to a Ziegler catalyst for polymerization of butadiene, e.g., to increase the speed or yield of polymerization, and that this combination would inherently produce a butadiene of enhanced 1,2-addition product.

Citing *In re Spormann*, the CCPA reversed:

However, appellant is not claiming simply a process for preparing polybutadiene. Rather it is a process for preparing a particular polybutadiene having a particular microstructure and particular properties.

Concededly, the reference combination does not teach that the Crawford process, as modified by the disclosure of Badische-Anilin would produce the product sought by appellant and recited in his claims. We cannot ignore the particular product unexpectedly produced by the claimed process, as the Patent Office apparently has done, in determining whether the invention as a whole is obvious. Moreover, the fact that a rubbery polybutadiene having high 1,2-addition might be inherent in following the combined teachings of the prior art is quite immaterial if, as the record establishes here, one of ordinary skill in the art would not appreciate or recognize that inherent result. (152 USPQ at p. 108; emphasis in the original)

The court proceeded to quote the language of *Spormann* that is cited hereinabove.

It is respectfully submitted that *Shetty*, *Spormann*, and *Naylor* are controlling authorities which require that the instant rejection be withdrawn. *Dillon* related to a product claim, all recited features of which were obvious from the prior art, and is therefore inapposite.

While the recent Supreme Court decision in *KSR International v. Teleflex* may have supported the principle of *Dillon* with respect to the obviousness of combining references, it did not deal with a claim containing features not suggested in the references. Thus, *Shetty*, *Spormann*, and *Naylor* remain consistent with the standard espoused by both the Federal Circuit and the Supreme Court.

IV. The Process of Claim 1 is Not Inherent in the Combination of Barstad and Creutz

Moreover, even if the applicable authorities supported a finding of obviousness based on inherency where positively recited features of the claim are not suggested in any of the references, the references of record would still fail to support

a *prima facie* basis for obviousness of the subject matter of the instant claims.

More particularly, it is respectfully submitted that the claimed invention is not inherent, even latently inherent, in the combination or combinations that might be constructed by combining Barstad and Creutz.

Even in the context of novelty, inherency cannot be established unless the claimed invention would inevitably and invariably be reproduced in replication of the teachings of the reference, *Continental Can v. Monsanto*, 948 F.2d 1264, 1267-68 (Fed. Cir. 1991), *In re Oelrich*, 212 USPQ 323 (CCPA 1981); *In re Rijckaert*, 28 USPQ2d 1955 (Fed. Cir. 1994). Certainly, no lesser standard can apply under §103(a) when invoked under the authority of *Dillon*.

Even where inherency is based on a single reference, it is not established by mere probabilities, *Continental Can*. Latent inherency is an even more elusive concept where no single reference describes the claimed method or structure, either explicitly or inherently. As the C.C.P.A. has observed in this context, what is unknown cannot be obvious, *In re Spormann*, 150 USPQ 449, 452 (CCPA 1966).

Reference Leveling Agent Concentrations

If one skilled in the art were to have combined Barstad and Creutz, the only rational combination would have been to substitute one of the leveling agents listed or cross-referenced in col. 6, line 64 to col. 7, line 17 of Barstad for the ethoxylated leveling agent of Creutz, or to use no leveling agent at all, because Barstad teaches that the leveling agent is unnecessary.

Moreover, even in the optional embodiment in which a leveling agent is used, Barstad calls for only a very low

concentration of leveling agent, i.e., "[t]ypical concentrations of leveling agents range of 0.05 to 0.5 mg/L" (col. 7, lines 17-19). Moreover, since the leveling agent is only optional in Barstad, and is entirely omitted from the working examples, one skilled in the art reading the reference would recognize that concentrations even lower than 0.05 mg/L could be used.

In view of the teachings of Barstad dismissing the need for levelers of any kind, relegating them to exceptionally low concentrations at which the solubility concerns of Creutz would not have been likely to apply, and entirely omitting any mention of the ethoxylated polyethylenimines which Creutz promoted for solubility reasons, it cannot be deemed inevitable that the claimed chloride enhancement would have been achieved using the plating bath that might be constructed from the combination of Barstad and Creutz. Far from inevitable, achievement of the claimed result would be highly improbable. Certainly, chloride enhancement would not be achieved by the working examples of Barstad which entirely omit a leveling agent, and there is no basis for expectation that it would be achieved over the wide universe of combinations of leveler concentration with chloride concentration that are effectively disclosed by Barstad, especially since chlorides are also only optional in this reference. Inherency cannot be based on the leveler concentrations taught in Creutz because that reference does not suggest plating of an integrated circuit device, while Barstad, who does, teaches away from the leveler concentrations which Creutz discloses. Thus, the requisite evidence of inherency is not present, and the rule of *Dillon* does not apply.

In terms of specific claim language, there is no basis in the record for concluding that the proportions of leveling agent taught by Barstad or Creutz would inevitably and invariably constitute "an effective amount of a defect reducing agent," as

required by claims 1 and 17, much less that they would inevitably and invariably result in the enhanced chloride level that is further called for by these claims. Applicants can agree that references are evaluated by what they collectively suggest to one versed in the art, and one so versed would not remotely find any suggestion of enhanced chloride levels in the references that are cited here.

Inherency may be further negated by consideration of chloride content.

Reference Chloride Content

The presence of chlorides is also only optional in the bath of Barstad. As stated in the specification at col. 4, lines 27-33:

A wide range of halide ion concentrations (if a halide ion is employed) may be suitably utilized, e.g., from about 0 (where no halide ion is employed) to 100 parts per million (ppm) of halide ion in the plating solution, more preferably from about 25 to about 75 ppm of halide ion. (emphasis supplied)

Thus, not only do Barstad et al. contemplate a bath containing no halide ion at all, but, by use of the generic term "halide," they further teach that the halide ion is not necessarily chloride but could presumably be bromide or even iodide or fluoride. Thus, a combination of the references does not lead to a plating solution that inevitably contains any chloride at all, much less one that would necessarily have a threshold chloride content sufficient for material enhancement of the chloride content of the copper deposit.

Applicants recognize that, if it is assumed *arguendo* that if Barstad were combined with Creutz to provide some low concentration of leveling agent, and that if the leveling agent were produced by reaction of polyethylenimine and benzyl

chloride, some inconsequential concentration of chloride ion would come along with the leveling agent. However, even by hindsight, such negligible concentration would not be expected to materially enhance the chloride content of the deposit.

Even if Extended to Process Claims, the Principle of *Dillon* Remains Inapplicable

As explained above, the authority of *Dillon* is limited to composition claims wherein all features of the claim are positively rendered obvious by the prior art, while *Shetty*, *Naylor*, and *Spormann* enunciate a different rule for process claims which recite features that are not rendered obvious, but at most are only inherent in the combination of references. While effectively endorsing the principle of *Dillon*, the decision in *KSR* dealt with product claims; and, even if the distinction between product and process claims is ignored, *Dillon* is inapplicable, and *KSR* is not specifically applicable, to the facts prevailing here, because the positive claim requirement of enhanced chloride content is not remotely suggested by the combination of references.

Moreover, as further explained hereinabove, *prima facie* obviousness is negated on the independent basis that it would not have been obvious to combine Barstad et al. with Creutz in the first place. One skilled in the art would have viewed these references, not as candidates to be combined, but rather as alternative solutions to problems in the plating of printed circuit boards, with the later-issued Barstad reference effectively rendering the earlier Creutz reference obsolete. In *Dillon* by comparison, structural obviousness was effectively conceded. On this basis alone, *Dillon* does not apply.

As still further explained, even if it is assumed *arguendo* that it would have been obvious to combine the Barstad and

Creutz references for some purpose, the combination would not yield the claimed invention, even by latent inherency. In *Dillon*, *prima facie* obviousness rested on the express structural disclosure, not on latently inherent properties. On this further ground, *Dillon* does not apply.

In *Dillon*, the reference made it obvious to prepare the composition as specifically claimed, albeit for a purpose other than that for which the applicant *Dillon* had developed the composition. The claim was to a composition comprising a hydrocarbon fuel and a tetra orthoester while the prior art was to a composition comprising a hydrocarbon fuel and a tri orthoester. *Dillon* disclosed that the tetra ester was effective in reducing particulate emissions from fuel combustion. The court found the claimed composition structurally obvious from the reference, and found that there was motivation to prepare the claimed composition for the purpose stated in the reference, i.e., "dewatering" the fuel. The court held that, for purposes of finding *prima facie* obviousness in claims to the composition, it was unnecessary to determine whether it would have been obvious to prepare the claimed composition for the applicant's purpose. It was sufficient that it be obvious to prepare it for any purpose, e.g., the purpose disclosed in the reference. Nothing in *Dillon*'s claims was merely inherent in the prior art. Instead the specific structure recited the claims, i.e., the tetra orthoesters, was found obvious from the express disclosure of the tri esters in the reference. Nor did the rejection in *Dillon* rely on any latently inherent property possessed by the reference. While the capability of reducing particulate emissions may or may not have been latently inherent in the prior art, the court did not rely on any such inherency to sustain the rejection. Instead, the court relied on the structural obviousness of preparing the tetra ester composition,

e.g., for the "dewatering" function that the reference expressly disclosed for the tri orthoesters.

Here nothing in the combination of Barstad and Creutz remotely suggests the structural requirement that the electroplating bath contain "an effective amount of a defect reducing agent to increase an overall chloride content of the copper deposit." As further demonstrated, combining the references would not inevitably produce an electroplating bath having the latently inherent capability of increasing the chloride content of the copper deposit. There is absolutely no evidence of any specific combination or range of concentrations of alkoxyated polyethylenimine leveling agent and chloride ion that inherently increases the chloride content, especially since the references offer a rather wide selection of alternative leveling agents other than that required by the instant claims, and the compositional ranges broadly taught by the references run down to zero leveling agent content and zero chloride content. With no focus, recognition or hint of enhanced chloride content in the deposit, the references cannot be combined to place one skilled in the art in possession of a plating bath which includes: (i) the right leveling agent, i.e., the alkoxyated polyethylenimine; (ii) a sufficient leveling agent content to enhance the chloride content of the deposit; and (iii) a threshold chloride ion content sufficient for the enhancement to occur. Only by blind chance would one skilled in the art be led to combine the references in a manner that would inherently yield a plating bath of the requisite capability.

At very most, a hindsight construction of the reference might yield a plating bath comprising a combination of copper ions, chloride ions, and defect reducing agent in a combination of wide ranges of proportions which, at the very most, might conceivably encompass a composition having the claimed effect.

However, inherency is not established on such basis because such ranges would also include a host of compositions which would manifestly fail to possess the claimed capability. In fact, it can be argued that most if not all such compositions would likely fail. In this case inherency is not only evitable, but highly improbable.

Inherency sufficient to invoke *Dillon* could be found only if the references render obvious either: (i) a specific composition, having a specific defect reducing agent content, a specific chloride content, and other compositional features and properties such that it would inevitably and invariably provide the claimed effect on the chloride content of the deposit; or (ii) a subgenus of compositions, all species of which would inevitably and invariably have the claimed effect. According to applicants' reading of the outstanding Office action, the Examiner is making no such contentions. In any case, the Examiner has not identified any specific composition taught by the references that would have such effect, nor has she identified any subgenus of electroplating bath compositions, all species of which would have such effect.

It is, therefore, respectfully submitted that, even if it assumed for purposes of argument that it would have been obvious to combine the Barstad and Creutz references, the combination does not yield the claimed invention.

IV. Claims 17 and 72-74

It is respectfully submitted that each of claims 17 and 72-74 is patentable over the art of record on the basis fully discussed hereinabove.

With regard to claim 74, Pedersen may teach the use of silicon wafers in semiconductor integrated circuits, but does not contain any disclosure which makes up for the deficiencies

of Barstad and Creutz with respect to the use of a defect reducing agent comprising the reaction product of benzyl chloride and hydroxyethylenimine in superfilling submicron reliefs whereby the occurrence of protusion defects from superfilling, surface roughness, and voiding due to uneven growth are reduced, or in which macro-scale planarity across the semiconductor integrated circuit device substrate is reduced. Much less does Pederson suggest the use of a defect reducing agent in an effective amount to increase the overall chloride content of the copper deposit, as is further required by all claims including claim 74.

It is therefore respectfully submitted that all claims, including claims 17 and 72-74 are patentable over the art of record under 35 USC §103(a).

V. Conclusion

In view of the foregoing, reconsideration and early allowance of all claims are respectfully solicited.

Respectfully submitted,

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